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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,324	09/21/2006	Aquino Fabrice	4662-172	9386
23117	7590	06/20/2007		
NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			EXAMINER ZUCKER, PAUL A	
			ART UNIT 1621	PAPER NUMBER
			MAIL DATE 06/20/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/576,324	<b>Applicant(s)</b> FABRICE ET AL.	
	<b>Examiner</b> Paul A. Zucker	<b>Art Unit</b> 1621	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \* c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
         3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>9/21/2006</u> . | 6) <input type="checkbox"/> Other: ____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

1. Claim 4 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 4 recites the limitation "preferably" in line 2. The limitation "preferably" renders the claim indefinite because it is unclear whether the less preferred embodiments are also part of the claimed invention. Claim 4 is therefore rendered indefinite.
2. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 6 recites the limitation "preferably" in line 2. The limitation "preferably" renders the claim indefinite because it is unclear whether the less preferred embodiments are also part of the claimed invention. Claim 6 is therefore rendered indefinite.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Takahashi et al (US 5,908,956 06-1999) in view of Rona (US 3,920,582 11-1975).

Instantly claimed is a process for the preparation of 2,3-5-trimethyl-1, 4-hydroquinone diacylates by reacting ketoisophorone with an acylating agent in the presence of methane trisulfonic acid.

Takahashi teaches (Column 6, lines 1-18) a process for the reaction of ketoisophorone (0.066 mole) with acetic anhydride (0.196 mole) in approximately 1:3 molar ratio in the presence of Nafion resin (a sulfonated tetrafluoroethylene copolymer presumed 0.8meq/g) at 100°C to give 2,3, 5-trimethylhydroquinone diacetate in a yield of 85%. Takahashi teaches (Column 2, line 23- column 3, line 14) a large variety of solid acid catalysts. The amount of catalyst to employ is readily determined by one of ordinary skill in the art in the optimization of the process.

Takahashi teaches (Column 1, lines 1-4) the conversion of 2,3, 5-trimethylhydroquinone diester to vitamin E by known methods.

The difference between the process taught by Takahashi and that instantly claimed is that, while Takahashi teaches a variety of solid acid catalysts (including the Nafion

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sulfonated resin exemplified as discussed above), he does not appear to contemplate the use of methane trisulfonic acid as is instantly claimed.

Rona, however, teaches (Abstract) a catalyst for carrying out heterogeneous catalytic chemical reactions which is a composite which comprises a solid carrier and a sulfonic acid with at least two sulfonic acid groups per molecule. Rona teaches (Column 4, line 61-column 5, line 15) a silica-supported methane trisulfonic acid. Rona teaches (Column 2, line 51-column 3, line 13) that conventional polymeric sulfonic acid catalysts suffer from thermal degradation.

Thus one of ordinary skill in the art would have been motivated to replace the thermally labile catalyst of Takahashi with the silica-supported methane trisulfonic acid of Rona in order to both extend the useful catalyst life and permissible operating temperature range of the process of Takahashi. Because of the broad latitude in catalyst structure/type taught by Takahashi, there would have been a reasonable expectation for success.

Thus the instantly claimed process for the preparation of 2,3,5-trimethyl-1, 4-hydroquinone diacylates would have been obvious to one of ordinary skill in the art.

### ***Conclusion***

4. Claims 1-7 are pending. Claims 1-7 are rejected.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 571-272-0650. The examiner can normally be reached on Monday-Friday 5:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richter R. Johann can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

A handwritten signature in black ink, appearing to be 'Paul A. Zucker', with a large, stylized initial 'P' and 'Z'.

Paul A. Zucker  
Primary Examiner  
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